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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/650,288	08/28/2003	Jeffrey Howard Nussbaum	132286	6683

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John S. Beulick  
Armstrong Teasdale LLP  
One Metropolitan Square, Suite 2600  
St. Louis, MO 63102

EXAMINER

MCALLENAN, JAMES M

ART UNIT	PAPER NUMBER
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3745

DATE MAILED: 09/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/650,288

Applicant(s)

NUSSBAUM ET AL.

Examiner

James M McAleenan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8/28/2003.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5-12, 14, 16-20 are rejected under 35 U.S.C. 102(b) as being anticipated by either Kraig (U.S. Patent Number 4,012,165) or Schnell (U.S. Patent Number 3,012,709). The presented prior art discloses a method for fabricating a rotor blade for a gas turbine engine, wherein an airfoil has a first and second sidewall that each extend in a radial span between and airfoil root and tip (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) (see Figures 3-5 and Col. 3, lines 23-26, 35-40 and Col. 4, lines 19-50 of Schnell). The presented prior art discloses the first and second sidewalls being connected at a leading and trailing edge. The presented prior art discloses a winglet extending outwardly from the airfoil first and second sidewalls, wherein a radius extends between the winglet and the airfoil first sidewall and second sidewall (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) (see Figures 3-5 and Col. 4, lines 19-50 of Schnell). Regarding claim 2, the presented prior art discloses a winglet extending outwardly from the airfoil first sidewall and second sidewall, wherein the first and second winglets extend outwardly from the first sidewall and second sidewall respectively, positioned at a first radial and second radial distance from the tip respectively (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) (see Figures 3-5 and Col. 4, lines 19-50 of Schnell). Regarding claim 3, the presented prior art discloses a winglet extending outwardly from the airfoil first sidewall and second sidewall. The

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presented prior art discloses the winglet structurally supporting the airfoil such that a natural frequency of chord-wise vibration of the airfoil is increased to a frequency that is not present within the gas turbine engine during the engine operations (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) (see Figures 3-5 and Col. 4, lines 19-50 of Schnell). Regarding claim 5, the presented prior art discloses a winglet that extends outwardly from the airfoil first and second sidewalls having a substantially non-rectangular cross sectional profile. Regarding claim 6, the presented prior art discloses an airfoil of a gas turbine engine having a leading and trailing edge, as well as a root and tip (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) (see Figures 3-5 and Col. 3, lines 23-26, 35-40 and Col. 4, lines 19-50 of Schnell). The presented prior art discloses the first sidewall extending in radial span between an airfoil root and tip, wherein the first sidewall defines a first side of the airfoil (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) (see Figures 3-5 and Col. 4, lines 19-50 of Schnell). The presented prior art discloses the second sidewall connected to the first sidewall at the leading edge and trailing edge. The presented prior art discloses the second sidewall extending in a radial span between the airfoil root and tip, wherein the second sidewall defines a second side of the airfoil. Regarding claim 7, the presented prior art discloses at least one of the airfoil first and second sidewalls being concaved and the remaining sidewall is convex (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) (see Figures 3-5 and Col. 4, lines 19-50 of Schnell). The presented prior art discloses the winglet being substantially flush with the at least one of the first and second sidewalls at the airfoil leading edge. Regarding claim 8, the presented prior art discloses at least one of the airfoil first sidewall and second sidewall being concave and the remaining sidewall being convex (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) (see Figures 3-5 and Col. 4, lines 19-50 of

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Schnell). The presented prior art discloses the winglet being substantially flush with the at least one of the first and second sidewalls at the airfoil trailing edge. Regarding claim 9, the presented prior art discloses the winglet being a radial distance from the airfoil tip. Regarding claim 10, the presented prior art discloses the winglet being configured to provide structural support to the airfoil such that a natural frequency of torsional or chord-wise vibration of the airfoil is increased to a frequency that is not present within the gas turbine engine during engine operations (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) (see Figures 3-5 and Col. 4, lines 19-50 of Schnell). Regarding claim 11, the presented prior art discloses the winglet having a non-rectangular cross-sectional profile. Regarding claim 12, the presented prior art discloses the first winglet extending outwardly from the first sidewall and the second winglet extending outwardly from the second sidewall. Regarding claim 14, the presented prior art discloses a gas turbine engine rotor blade airfoil having a root, tip, leading and trailing edge (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) (see Figures 3-5 and Col. 3, lines 23-26, 35-40 and Col. 4, lines 19-50 of Schnell). The presented prior art discloses the airfoil having a first and second sidewall, wherein a winglet extends outwardly from at least one of the first and second sidewalls. The presented prior art discloses a radius being formed between the winglet and at least one of the first and second sidewalls, wherein the airfoil first and second sidewalls are connected axially at the leading and trailing edges (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) (see Figures 3-5 and Col. 4, lines 19-50 of Schnell). The presented prior art discloses the first and second sidewalls extending radially from the root to the tip. Regarding claim 16, the presented prior art discloses at least one of the first and second sidewalls being concave and the remaining sidewall being convex. The presented prior art discloses at least one winglet substantially flush with at

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least one of the first and second sidewalls of the leading edge (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) (see Figures 3-5 and Col. 4, lines 19-50 of Schnell). Regarding claim 17, the presented prior art discloses at least one first sidewall and second sidewall being concaved and at least one of the first and second sidewall being convex. The presented prior art discloses at least one winglet substantially flush with at least one of the first and second sidewalls of the trailing edge. Regarding claim 18, the presented prior art discloses at least one winglet being a radial distance from the tip (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) (see Figures 3-5 and Col. 4, lines 19-50 of Schnell). Regarding claim 19, the presented prior art discloses at least one winglet facilitates structural support to the airfoil such that a natural frequency of torsional or chord-wise vibration of the airfoil is increased to a frequency that is not present within the turbine engine during engine operations (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) (see Figures 3-5 and Col. 4, lines 19-50 of Schnell). Regarding claim 20, the presented prior art discloses at least one winglet having a first winglet extending outwardly from the airfoil first sidewall and a second winglet extending outwardly from the airfoil second sidewall (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) (see Figures 3-5 and Col. 4, lines 19-50 of Schnell).

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Kraig (U.S. Patent Number 4,012,165) (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) or Schnell (U.S. Patent Number 3,012,709) (see Figures 3-5 and Col. 3, lines 23-26, 35-40 and Col. 4, lines 19-50 of Schnell) in view of Mendham (U.S. Patent Number 5,269,057) (see Col. 3, lines 40-50 of Mendham). The above presented prior art devices (Kraig and Schnell) in the rejection of claim 1 above, discloses all the claimed elements except (Regarding claim 4) forming the winglet using an electro-chemical machining process.

However, Mendham (U.S. Patent Number 5,269,057) (see Col. 3, lines 40-50 of Mendham) discloses an electro-chemical machining process on a rotor blade of a gas turbine engine. It would have been obvious (and well known within the art) to one having ordinary skill in the art, at the time applicant's invention was made, to modify the presented prior art devices (Kraig and Schnell) by incorporating an electro-chemical machining process as taught by Mendham, for the purpose of using a machining process as claimed by Applicant's claimed invention.

3. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Kraig (U.S. Patent Number 4,012,165) (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) or Schnell (U.S. Patent Number 3,012,709) (see Figures 3-5 and Col. 3, lines 23-26, 35-40 and Col. 4, lines 19-50 of Schnell) in view of Mendham (U.S. Patent Number 5,269,057) (see Col. 3, lines 40-50 of Mendham). The above presented prior art devices (Kraig and Schnell) in the rejection of claim 6 above, discloses all the claimed elements except (Regarding claim 13) forming the winglet using an electro-chemical machining process.

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However, Mendham (U.S. Patent Number 5,269,057) (see Col. 3, lines 40-50 of Mendham) discloses an electro-chemical machining process on a rotor blade of a gas turbine engine. It would have been obvious (and well known within the art) to one having ordinary skill in the art, at the time applicant's invention was made, to modify the presented prior art devices (Kraig and Schnell) by incorporating an electro-chemical machining process as taught by Mendham, for the purpose of using a machining process as claimed by Applicant's claimed invention.

4. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Kraig (U.S. Patent Number 4,012,165) (see Figure 1-2 and 4 and Col. 3, lines 5-36 of Kraig) or Schnell (U.S. Patent Number 3,012,709) (see Figures 3-5 and Col. 3, lines 23-26, 35-40 and Col. 4, lines 19-50 of Schnell) in view of Mendham (U.S. Patent Number 5,269,057) (see Col. 3, lines 40-50 of Mendham). The above presented prior art devices (Kraig and Schnell) in the rejection of claim 14 above, discloses all the claimed elements except (Regarding claim 13) forming the winglet using an electro-chemical machining process.

However, Mendham (U.S. Patent Number 5,269,057) (see Col. 3, lines 40-50 of Mendham) discloses an electro-chemical machining process on a rotor blade of a gas turbine engine. It would have been obvious (and well known within the art) to one having ordinary skill in the art, at the time applicant's invention was made, to modify the presented prior art devices (Kraig and Schnell) by incorporating an electro-chemical machining process as taught by Mendham, for the purpose of using a machining process as claimed by Applicant's claimed invention.



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### **PRIOR ART**

The prior art made of record but not relied upon is considered pertinent to applicant's disclosure and consists of 8 patents.

Carter (U.S. Patent Number 6,524,070) is cited to show the similar electro-chemical machining process as claimed by Applicant's invention.

Huebner (U.S. Patent Number 6,503,053) is cited to show similar winglet features as claimed by Applicant's invention.

Barnstead (U.S. Patent Number 3,758,231) is cited to show similar winglet features as claimed by Applicant's invention.

Wagner (U.S. Patent Number 4,108,573) is cited to show similar winglet features as claimed by Applicant's invention.

Strelshik (U.S. Patent Number 3,706,512) is cited to show similar winglet features as claimed by Applicant's invention.

Eccles et al. (U.S. Patent Number 3,412,611) is cited to show similar method forming winglet features as claimed by Applicant's invention.

Erwin et al. (U.S. Patent Number 3,193,185) is cited to show similar winglet features as claimed by Applicant's invention.

King, Jr. et al. (U.S. Patent Number 3,653,110) is cited to show similar winglet features as claimed by Applicant's invention.

Lee (U.S. Patent Number 2,920,864) is cited to show similar winglet features as claimed by Applicant's invention.

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### CONTACT INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M McAleenan whose telephone number is 703-308-2827.


The examiner can normally be reached on M-F 8:30-4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look can be reached on 703-308-1044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

 9/17/04

James M. McAleenan  
Patent Examiner  
703-308-2827

  
**EDWARD K. LOOK**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 3700**

9/25/04